

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-026223

(43)Date of publication of application : 27.01.1995

(51)Int.Cl.

C09J 7/02
C09J 7/02
C09J 7/02
C09J 7/02
B32B 27/36
C08J 7/04
G02B 5/30
G02F 1/1335
// B32B 7/02
B32B 7/10
G02B 1/10

(21)Application number : 05-194258

(71)Applicant : DAINIPPON PRINTING CO LTD

(22)Date of filing : 08.07.1993

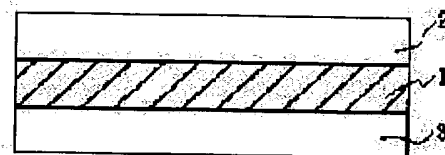
(72)Inventor : NAKAMURA NORINAGA
NORITAKE YUUGO

(54) HIGHLY TRANSPARENT AND SLIGHTLY STICKY ANTISTATIC PROTECTIVE FILM

(57)Abstract:

PURPOSE: To prepare a highly transparent antistatic protective film which can be applied to various displays, esp. a liq. crystal display, hardly causes reflection of light due to the difference in refractive index of light at the interface of the film and a polarizing plate stuck to the film.

CONSTITUTION: This highly transparent and slightly sticky protective film is obtd. by forming an antistatic layer 2 on one side of a substrate film 1 made of a monoaxially oriented polyethylene terephthalate film and forming an acrylic self-adhesive layer 3 on the other side of the substrate film 1. The protective film may comprise the substrate film 1, an antistatic layer 2 formed on one side of the substrate film 1, and an acrylic self-adhesive layer 3 formed on the surface of the antistatic layer 2.



* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The fine adhesion high transparence protection film which has the antistatic nature characterized by forming an antistatic layer in one field of the base material film which consists of a uniaxial-stretching polyethylene terephthalate film, and preparing the acrylic adhesive layer in the field of another side of this base material film.

[Claim 2] The fine adhesion high transparence protection film which has the antistatic nature characterized by forming an antistatic layer in one field of the base material film which consists of a uniaxial-stretching polyethylene terephthalate film, and preparing the acrylic adhesive layer in the front face of this antistatic layer further.

[Translation done.]

* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the high protection film of the transparency which antistatic nature is given and has fine adhesiveness especially about the bright film stuck for the object of surface protections, such as various displays, such as a word processor, a computer, and television.

[0002]

[Description of the Prior Art] The laminating of the transparent protection films, such as polyethylene and polypropylene, is carried out to front faces, such as various displays, such as a word processor, a computer, and television, for the object of a surface protection. Although these protection films were removed by exfoliation in many cases after nests, such as a liquid crystal display, were completed, there was a problem that static electricity occurred and surrounding dust was involved in at the time of this exfoliation.

[0003] When conducting defective inspection of a product after transparency is inferior in polyethylene, polypropylene, etc. which are the transparent protection film of said former on the other hand and a display is incorporated, since the transparency of the protection film was inferior, it was difficult to conduct the defective inspection with a sufficient precision.

[0004]

[Problem(s) to be Solved by the Invention] Although it is possible to use a polyethylene terephthalate film with high transparency (PET film) in order to make the transparency of the aforementioned conventional transparency protection film increase, biaxial stretching of the PET film is carried out, and the refractive index is usually 1.66. By the way, when stuck for protection of this biaxial-stretching PET film of the polarizing plate on the front face of a liquid crystal display, there was a problem that it was difficult to discover the foreign matter with which an echo takes place and the refractive index of the triacetyl cellulose ingredient which is the construction material on the front face of a polarizing plate is mixed in defective inspection of the manufactured display product to 1.49 by the mutual interface since the refractive index of a biaxial-stretching PET film is as high as 1.66.

[0005] Then, it can apply to various displays, the echo by the difference of the rate of optical refraction cannot take place easily in an interface with the polarizing plate installed, and this invention aims at offering the high protection film of transparency by which generating of static electricity was prevented.

[0006]

[Means for Solving the Problem] Drawing 1 is the sectional view showing the lamination of the protection film of this invention, and, as for a base material film and 2, one is [an antistatic layer and 3] acrylic adhesive layers among drawing 1 . In order to solve the above mentioned technical problem, this invention uses a uniaxial-stretching polyethylene terephthalate film as the base material film 1, forms the antistatic layer 2 in one field of this base material film 1, and uses it as the fine adhesion high transparency protection film characterized by forming the acrylic adhesive

layer 3 in the field of another side of this base material film.

[0007] Drawing 2 is the sectional view showing another lamination of the protection film of this invention, and the number as drawing 1 with the same ingredient of each class in drawing 2 is given. In order to solve the above mentioned trouble, this invention uses a uniaxial-stretching polyethylene terephthalate film as the base material film 1, forms the antistatic layer 2 in one field of this base material film 1, and uses it as the fine adhesion high transparence protection film characterized by forming the acrylic adhesive layer 3 in the front face of this antistatic layer 2 further.

[0008] Since the uniaxial-stretching polyethylene terephthalate film is being used for the protection film of this invention as a base material film, transparency is high and the refractive index has become about 1.50. Since the refractive index of the polarizing plate is about about 1.49 when a polarizing plate is triacetyl cellulose when the protection film of this invention is installed by the polarizing plate arranged on the front face of the liquid crystal of a liquid crystal display, both refractive index does not have a parenchyma top difference. Therefore, in both interface, it is hard to produce an echo, and the foreign matter currently mixed can be easily discovered in defective inspection to it.

[0009] The antistatic layer in this invention is formed by applying an antistatic resin constituent. In the antistatic agent contained in this antistatic resin constituent For example, various kinds of cationic antistatic agents which have cationic radicals, such as quarternary ammonium salt, pyridinium salt, and the 1-3rd class amino group, The anion system antistatic agent which has anionic radicals, such as a sulfonate radical, a sulfate base, an phosphate radical, and a phosphonate radical, Both-sexes antistatic agents, such as an amino acid system and an amino sulfate system, an amino alcohol system, Various surfactant mold antistatic agents, such as an antistatic agent of the Nonion nature, such as a glycerol system and a polyethylene-glycol system, Furthermore, the macromolecule mold antistatic agent which carried out macromolecule quantification of the antistatic agent like the above is mentioned. Moreover, it has the 3rd class amino group and the 4th class ammonium, and polymerization nature antistatic agents, such as monomer and oligo NOMA in which polymerization is possible, for example, N, and N-dialkylamino alkyl (meta) acrylate monomers, and the 4th class compounds of those, can also be used by ionizing radiation.

[0010] Thus, there is no generating of static electricity in the protection film with which the resin constituent containing an antistatic agent was applied and manufactured. Therefore, when this protection film is installed to a polarizing plate, in case this protection film is exfoliated, there is no generating of static electricity, and dust does not adhere. Moreover, also when included in a liquid crystal display etc., the static electricity failure is not received from the exterior.

[0011] Since the fine adhesive layer is formed, in case the protection film of this invention is stuck, even if it fails, it has the advantage that it can restick finely. By this invention, the case where fine adhesion is 180 degrees C using a tensilon testing machine, and 1-50g /of measured value of the exfoliation force in exfoliation speed 300 mm/min is [inch] 3-15g/inch preferably is said. For example, an acrylic binder, a rubber system binder, and an urethane system binder are raised to the fine binder which forms this fine adhesive layer.

[0012]

[Example]

[Example 1] The film made from uniaxial-stretching polyethylene terephthalate (Toyobo Co., Ltd. make) was prepared as a base material film, it applied so that it might become 5 micrometer/dry on this base material film about the ultraviolet curing mold antistatic resin constituent EXG 40-13 (AS-1) [trade name:Dainichiseika Colour & Chemicals Mfg. Co., Ltd. make], and ultraviolet rays are irradiated, were stiffened, and the antistatic layer was formed on the base material film.

[0013] Next, the fine binder of the following presentation was prepared as an acrylic binder. To the ultraviolet curing mold resin constituent SK dyne 1496-D(trade name: Soken Chemical & Engineering, Inc. make, 35% content of ultraviolet curing mold resin) 100 weight section, 5 weight sections addition of the isocyanate system curing agent L-45 (trade name) was carried out as a curing agent, and it considered as the fine binder. It applied to another field of the

direction's base material film in which an antistatic layer does not form this fine binder so that it might become 10 - 15 micrometer/dry by the comma coat method, and it dried to it for 1 - 2 minutes at 80 degrees C, and the acrylic adhesive layer was formed in it. The obtained laminated film is a fine adhesion high transparency protection film which has antistatic nature with the high transparency which consists of three layers which made the base material film the inner layer.

[0014] [Example 2] In this example 2, the same thing as said example 1 was used for the ingredient for forming a base material film, an antistatic layer, and an acrylic adhesive layer.

[0015] one side of the film made from uniaxial-stretching polyethylene terephthalate (Toyobo Co., Ltd. make) -- ultraviolet curing mold antistatic resin constituent EXG40-13(AS-1) [trade name: --] by Dainichiseika Colour & Chemicals Mfg. Co., Ltd. was applied so that it might become 5 micrometer/dry, ultraviolet rays are irradiated, were stiffened, and the antistatic layer was formed on the base material film.

[0016] Subsequently, on this antistatic layer, the same fine binder as said example 1 was applied so that it might become 10 - 15 micrometer/dry by the comma coat method, and it dried for 1 - 2 minutes at 80 degrees C, and the acrylic adhesive layer was formed. The obtained laminated film is a fine adhesion high transparency protection film with which the antistatic layer and the acrylic adhesive layer were formed in one side of a base material film and which has antistatic nature with high transparency.

[0017]

[Effect of the Invention] Since the protection film with which the antistatic nature of this invention was given is using the uniaxial-stretching polyethylene terephthalate film as the base material film, it does not have the refractive index of the triacetyl cellulose film used for a polarizing plate, and a parenthesis top difference. Therefore, the protection film with which the antistatic nature of this invention was given can prevent that the echo of light arises in the interface between a protection film and a polarizing plate, and it has high transparency.

[Translation done.]